Theories & Models Used for eLearning

In 2003, Van Buren and Sloman suggested that 62 percent of all learning technology initiatives fail to meet expectations. Discouraging figures like that should prompt eLearning leaders to concern themselves with measures to ensure a successful eLearning program.

In one of your readings for this lesson, Driscoll and Carliner (2005) warn that eLearning failures are often due to the fact that designing e-learning is different than designing classroom and workbook-based learning" (p. 13), and this fact is often overlooked by those initiating eLearning efforts. Driscoll and Carliner caution against trying to devise a universal solution for eLearning design, since there are many factors that approach one takes, including the subject content, project budgets, schedules and the purpose of the course. They recommend concentrating on the specific problem that must be solved or content to be presented to guide design efforts.

That said, the more you know about learning and how people learn, the better you will be equipped to direct others as they seek to solve instructional problems. There are many different approaches to designing instruction and each one is based on different assumptions about learning and different philosophies about the purpose of instruction.

How do people learn?

What does it mean to "know" something? How do we learn or "come to know?" What is knowledge? These are questions concerning ***epistemology***, or the "study or theory of the origin, nature, methods, and limits of knowledge" (Webster's New World Dictionary of the American Language, 1970, p. 471). Definitions for how we come to know and how we learn represent one of the differences between learning theories, and the commonly accepted definition has changed several times over the past century. Herbert Simon, winner of the 1978 Nobel prize for Economics, stated that "knowing" no longer means being able to remember and repeat information, but now means being able to find and use information (Simon, 1996).

There are many different definitions of "learning." A few of those statements are included below for your consideration. Which descriptions of the learning process are new to you? With which ones do you agree?

Learning is…

- Biochemical activity in the brain.
- A relatively permanent change in behavior.
- Information processing.
- Remembering and recalling.
- Social negotiation.
- Thinking skills.

- Knowledge construction.
- Conceptual change.
- Contextual change (transferring knowledge from the instructional context to a new context).
- Active and experiential.
- Distributed among the community (changes in our relation to the cultures to which we are connected).
- Tuning your perceptions to your immediate environment.
- A self-organizing phenomenon (it is affected by numerous, unpredictable variables, but when people in a system need to learn, they will).
  [Adapted from Jonassen, D.H., Howland, J., Moore, J., & Marra, R.M. (2003). Learning to solve problems with technology: A constructivist perspective. Upper Saddle River, N.J.: Merrill Prentice Hall.]

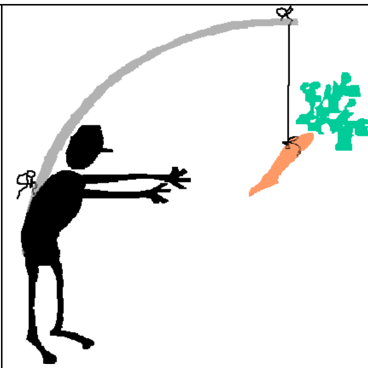
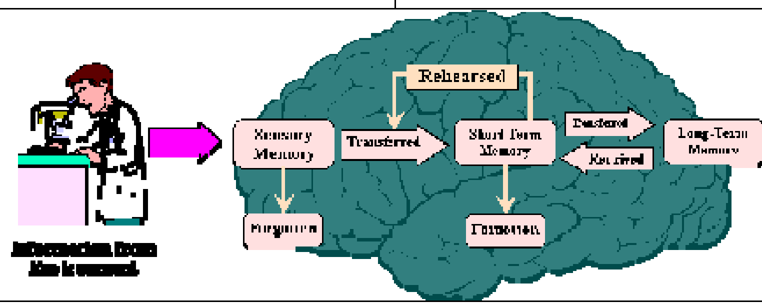
In their review of eLearning theories, frameworks and models, Mayes and de Freitas (2007) emphasize that it is important to be clear about the assumptions underlying eLearning designs. This is, in part, because they claim there really are no specific models for eLearning, only enhancements of existing models of learning which use technology to achieve better learning outcomes. They provide the following working definitions that are helpful in any discussion of theories, frameworks and models:

> *Theories of learning* are "empirically-based accounts of the variables which influence the learning process and provide explanations of the ways in which that influence occurs" (Mayes & de Freitas, 2005, p. 5). A *theory*… provides a general explanation for observations made over time, explains and predicts behavior, can never be established beyond all doubt, and may be modified.
>
> *Models of eLearning* "describe where technology plays a specific role in supporting learning. These can be described both at the level of pedagogical principles and at the level of detailed practice in implementing those principles" (ibid).

Driscoll and Carliner (2005) provide another helpful definition for the phrase *educational philosophy*, which they define as "a set of beliefs regarding the purpose of education" (p. 31). Your organization's philosophy of education may be explicitly stated or unstated, but it exists, nonetheless. It is the basic beliefs about why you are initiating eLearning, and this philosophy will guide your choices from the methods you use to teach the desired outcomes, to the type of activities and technologies you select.

Learning theories can provide a focal point for the reflective designer. Knowing *why* you do *what* you do in an instructional design lends coherence and consistency to your plans, and enables you to feel confident about the basis for your design. That confidence transfers to the learners, providing a sense of security in both the ability of the instruction to meet their needs and in their own ability to learn.

There are hundreds of learning theories, but three categories remain dominant: Behaviorism, Cognitivism, and Constructivism. Some eLearning designers claim to adhere religiously to one of these categories. You may hear them say:

<table>
<tr><td></td><td>"I'm a behaviorist."</td><td></td></tr>
<tr><td>"I'm a cognitive instructional designer."</td><td colspan="2">
</td></tr>
<tr><td></td><td colspan="2">"I take a constructivist approach to designing instruction."</td></tr>
</table>

Others take a pragmatist's approach and use "what works" - employing strategies introduced by several different theories to accomplish their aims in instruction. Such strategies are generally based on a specific *principle* or *assumption* about learning. Some of these principles and assumptions are universally accepted and can be used to justify a variety of theoretical designs.

Your readings for this lesson highlight those major categories of learning theory – Behaviorism, Cognitivism, and Constructivism (Driscoll & Carliner and Ertmer and Newby readings) – as well as those theories specific to the field of distance learning (Simonson, et al, reading). In the Anderson (2008) selection, you will read about the attributes of online instruction, the role of interaction, and a potential theory and model for online learning. This reading selection will highlight a few alternative theories and models that are being used in the field of eLearning.

Other Theories Used for eLearning

In addition to the "Big Three" learning theories (Behaviorism, Cognitivism, and Constructivism), you will come into contact with a wide variety of other theories, some of which are related to the Big Three and some which have evolved from the theoretical branch of social cognition.

Some of the theories and the assumptions upon which they are based are listed in the table below (from www.learning-theories.com and http://tip.psychology.org/theories.html).
Others can be viewed at:
http://www.teachersgarden.com/professionalresources/learningtheorists.html

Theory (Theorists)	Description	Assumptions About Learning
Cognitive Flexibility (Spiro)	The ability to spontaneously restructure one's knowledge in many ways in adaptive response to radically changing situational demands, to facilitate the transfer of knowledge and skills to new learning situations.	1. Learning activities must provide multiple representations of content. 2. Instructional materials should avoid oversimplifying the content domain and support context-dependent knowledge. 3. Instruction should be case-based and emphasize knowledge construction, not transmission of information. 4. Knowledge sources should be highly interconnected rather than compartmentalized.
Situated Learning (Lave)	Learning is unintentional and situated within authentic activity, context and culture. Cognitive apprenticeship (Brown, Collins, & Duguid) is a related idea.	1. Learning involves legitimate peripheral participation which is usually unintentional. 2. Knowledge must be presented in authentic contexts. 3. Social interaction and collaboration are essential components.
Communities of Practice (Lave & Wenger)	An aspect of Situated Learning, communities of practice provide a place for novices to interact with experts and gradually acquire more expertise.	1. Learning involves legitimate peripheral participation which is usually unintentional. 2. As the novice moves from the periphery of a community to its center, s/he becomes more active and engaged in the community and eventually becomes an expert.
Discovery Learning (Bruner)	A method of inquiry-based instruction that maintains it is best for learners to discover facts and relationships for themselves.	1. Learning occurs when individuals encounter problems that must be solved. 2. When learners are allowed to discover on their own, they are actively engaged, motivated, and independent.
Social Development (Vygotsky)	Social interaction precedes development, and consciousness and cognition are the end product of socialization and social behavior.	1. Social interaction plays a fundamental role in the process of cognitive development. 2. A more knowledgeable other (teacher, experienced peer, parent, etc) helps the learner in their attempt to learn. 3. Learning occurs in the Zone of Proximal Development (ZPD), which is the distance

Theory (Theorists)	Description	Assumptions About Learning
		between a student's ability with guidance and their independent ability.
Cognitive Load Theory		
Elaboration Theory		

You can complete the chart above and add other theories by referring to the information on theories of learning provided at:
http://tip.psychology.org/theories.html

Changes on the Horizon

In the past decade, new theoretical pathways and approaches have been suggested and are being investigated by researchers and practitioners. Those individuals leading eLearning efforts need to keep abreast of the developments in these new areas of research, since they impact the practice of eLearning (Haythornwaite, et al, 2007). For example:

- **Collaborative Learning** – Computer-Supported Collaborative Learning (CSCL) is a popular research field right now. There are many studies being conducted in the areas of learner collaborative behavior, learner-leaders, e-facilitation, and co-construction of knowledge. Some of the sub-areas of collaboration include distributed knowledge, distributed cognition, teamwork, scientific and interdisciplinary collaboration.

- **Learning Communities** – Another popular area is the study of learning communities. Researchers are investigating interactions and learning in virtual communities, group behavior and group learning, the behavior and learning of novices when interacting with experts in communities of practice (CoP), communities of inquiry, knowledge communities, and discourse communities.

- **Social Learning Networks** – The current prevalence of social networks on the Internet has prompted many educators to investigate how networking ties and relationships impact the learning process.

- **Other Areas of Research & Practice** – Other evolving areas for research in eLearning to be watching include Mobile Learning, Ubiquitous Learning, and persistent conversation (how communication in email, chat, blogs, and texting create records that can be used to enhance feedback in eLearning contexts).

Some of the questions that researchers are asking and investigating for eLearning environments include:

- What does collaboration or active learning look like in an eLearning context?
- What level of interactivity between learners is right for optimal learning?

- What does a “community” look like among online learners, and how does it foster learning?
- What should be added to eLearning systems to provide more information on social, educational and learning interactions?
- How will mobile technologies affect learning and eLearning efforts?
- How has the Internet encouraged ubiquitous (anytime/anywhere) learning and how does this affect who we learn from?

Fuzzy Boundaries Between Theories & Theorists

<table>
<tr><td></td><td>Just as there are an abundance of learning theories, there are also many learning theorists. As you do more research on these learning theories, you will find that some theorists are connected with more than one theory. In addition, some of the terms and strategies used by the different theories overlap. Ultimately, you will find that the strategies used in instructional design today are not really all that new. Many of today's theories and methods build on the work of earlier theorists or are merely re-statements of previous theoretical ideas.</td></tr>
<tr><td colspan="2">As you read about learning theories, remember that ideas about learning have been around since Aristotle and Plato. Many of these ideas have persisted and evolved as educational practice has moved from a Behaviorist perspective to a Cognitive, and more recently Constructivist, approach. Elements and strategies from all three theoretical camps are still used with success in education and training today. Learning about the different principles and assumptions and how they are reflected in teaching and learning strategies provides instructional designers with a variety of tools to use in designing effective instruction. Through practice, experimentation, and observation, you can begin to discover what strategies and approaches facilitate different types of learning.</td></tr>
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eLearning Models

Engelbrecht (2003) states that eLearning models began as mere replication of classroom instruction, but have evolved to those that integrate technology and pedagogy. Early models, such as the Demand-Driven model (MacDonald, et al, 2001), were focused on the *role of technology* in providing content, access and electronic services. The Demand-Driven model emphasizes the consumer demands for quality content, delivery and service.

More recent models have emphasized the *instructional design* of the eLearning instruction. Many appropriate the traditional instructional design models for eLearning, including Gagne’s Nine Events of Instruction (gain learner’s attention,

inform learner of objectives, stimulate recall of prior knowledge, present the content, provide guidance, give practice, provide feedback, assess), the traditional ADDIE model (Analyze, Design, Develop, Implement, Evaluate) model, the Instructional Systems Design (ISD) model, rapid prototyping, and the ARCS Motivation model, to name a few. New instructional design models are continually being promoted, although most of them emphasize similar steps in the process, including:

1. Needs analysis that verifies the need for the instruction for specific content, the need for it to be online, and the costs;

2. Student profiling to identify the learners' needs and expectations, and their characteristics (e.g., age, culture, work experience, prior knowledge of the subject, goals and motivation, attitudes toward eLearning, learning styles, computer literacy, access to technology, etc.);

3. Determination of organizational support for the eLearning and the goals for the program. This includes the vision and mission of the organization, whether it has a culture that emphasizes learning, implementation costs and sustainability, experience of the content experts and the instructional designers, technology infrastructure, and resource availability; and

4. Selection of pedagogy that meets the requirements of the subject matter and the needs of the target learners, including learning theories, objectives, delivery methods, assessment, interaction, and the development strategy (Engelbrecht, 2003).

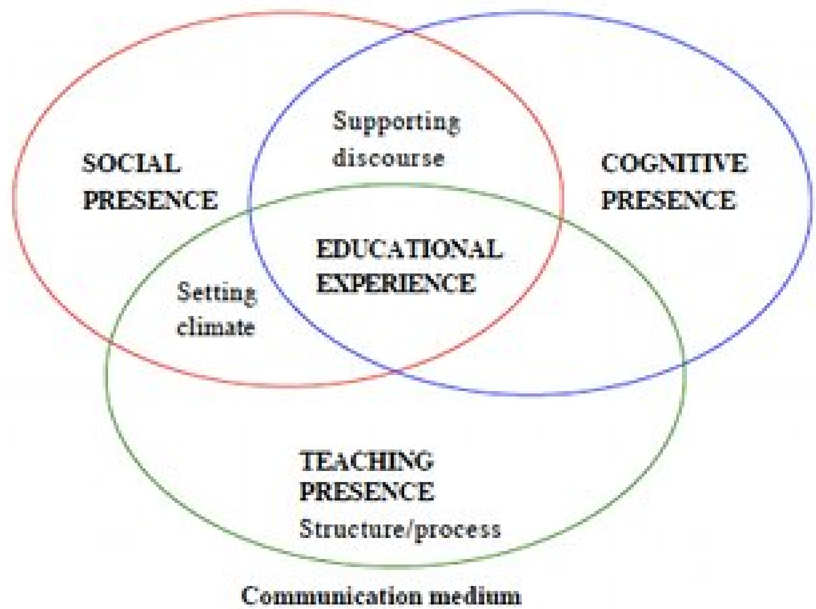
Finally, several models that emphasize the *interactions* possible in eLearning (learner to instructor, learner to learner, learner to content, learner to context) have been suggested. One example of this is the Community of Inquiry model developed by Garrison and Anderson (2003).

The Community of Inquiry model focuses on the context of the learning experience and the interactions that drive the learning. This model emphasizes that learners interact in a community and should be encouraged to take responsibility for their own learning. Garrison and Anderson state that eLearning designers should consider three key elements when designing the instruction:

- the *social presence* of the learner which is the ability of learners to establish themselves socially and emotionally as a real person through the learning experiences;

- the *cognitive presence* of the learner which refers to their ability to construct and confirm meaning through interaction and reflection; and

- the *teaching presence* which involves the provision of structure and a process for the learning.



Community of Inquiry Model (Garrison & Anderson 2003:28)

Social presence is controversial. Some researchers say it matters because studies have shown a relationship between it and student satisfaction, the development of a community of learners, and perceived learning (Lowenthal, 2009). Other researchers challenge those findings (Wise, et al, 2004). Some suggestions for improving social presence include providing opportunities for student and teacher profiles within a course or learning management system, limit class sizes, structure collaborative and interactive learning activities, utilize group work strategies, regular instructor postings to the discussion forum, promptly provide feedback, address students by name, and encourage students to share personal stories and experiences (Lowenthal, 2009).

There are many more models that can form the basis for the design of eLearning. Consider the wide variety of models listed at Martin Ryder's Instructional Design Models site, at: http://carbon.cudenver.edu/~mryder/itc_data/idmodels.html

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